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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/566,596	Applicant(s) JARVINEN ET AL.	
	Examiner LOIS ZHENG	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/31/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Claims 1-17 are amended in view of applicant's preliminary amendment filed 31 January 2006. Therefore, claims 1-17 are currently under examination.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claim 17 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-4, 6-8, 10-12 and 14-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
6. Claim 1 recites the limitation "the redox potential", "the acidity", "the process variable", "the desired direction", "the measurement results", "the measurements", "the

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sludge", "the reactor vessel", "the reactor solution", "the BT value", "the measuring instrument". There are insufficient antecedent bases for these limitations in the claim.

Claim 2 recites the limitation "the solid matter". There is insufficient antecedent basis for this limitation in the claim.

Claim 3 recites the limitation "the measurement results" and "the introduction of zinc powder". There are insufficient antecedent bases for these limitations in the claim.

Claim 4 recites the limitation "the measurement results", "the redox potential", "the sludge", "the acidity/basicity", "the solid matter content", "the solution" and "the temperature". There are insufficient antecedent bases for these limitations in the claim.

Claim 6 recites the limitation "the measuring instrument", "the redox potential", "the outlet pipe" and "the connecting pipe between reactors". There are insufficient antecedent bases for these limitations in the claim.

Claim 7 recites the limitation "the measuring instrument of acidity" and "the reactor vessel". There are insufficient antecedent bases for these limitations in the claim.

Claim 8 recites the limitation "the measurement of the redox potential". There is insufficient antecedent basis for this limitation in the claim.

Claim 10 recites the limitation "the measuring instrument". There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "the desired process variable". There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation “the redox potential”, “the process variables”, “the desired direction”, “the measurement results”, “the reactor vessel”, “the pipe”, “the sludge”, “the reactor solution”. There are insufficient antecedent bases for these limitations in the claim.

Claim 14 recites the limitation “the connecting pipe”. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 recites the limitation “the reactor vessel”. There is insufficient antecedent basis for this limitation in the claim.

Claim 16 recites the limitation “the redox potential”. There is insufficient antecedent basis for this limitation in the claim.

7. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by “such as” and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 10 recites the

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broad recitation that “the measuring instrument is regularly washed”, and the claim also recites “preferably at intervals of 1-2 hours” which is the narrower statement of the range/limitation.

8. Claim 17 provides for the use of an apparatus, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over DE 3,819,020(DE'020), further in view of Gonzalez Dominguez et al. US 5,833,830 (Gonzalez Dominguez), and further in view of Rantapuska et al. US 4,917,775 (Rantapuska), and in view of applicant's admitted prior art, and further in view of Haanstra et al. US 6,606,901 B1(Haanstra).

Regarding claim 1, DE'020 teaches a process for removing impurities in a zinc preparation process (title), comprising a first step that removes major portion of Cu impurities, a second step that removes remaining Cu, as well as Co, Ni and Ge, and a third step that removes Cd (page 2 of the machine translation, 3rd paragraph). DE'020 further teaches that measurements of redox potential are made and the results are used

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to optimize the feeding of zinc powder (abstract, page 1 of the machine translation, 1st paragraph, page 4 of the machine translation, 5th paragraph). The redox potential measurement device as taught by DE'020 comprises a platinum electrode and a reference electrode (page 4 of the machine translation, 9th paragraph).

However, DE'020 does not teach that measurement of the redox potential is done outside the reactor and the redox potential measurement device is cleaned periodically. DE'020 also does not explicitly teach the claimed measurement of acidity and/or basicity determined by BT value measurement.

Gonzales Dominguez teaches optimizing process variables of a zinc electrowinning cell by monitoring the redox potential of the electrolyte of a spent electrolyte overflow stream (abstract, col. 2 lines 46-48, col. 3 lines 40-42), which implies that the redox potential is measured outside of an reactor.

In light of the teachings of Gonzales Dominguez, one of ordinary skill in the art would have found it obvious to have performed measurements of the redox potential of the solution in each of the three metal removal steps of DE'020 outside of the reactor with expected success.

Rantapuska also teaches measuring of redox potential in a metal recovery process (title, abstract). Rantapuska further teaches that the surface of the measuring electrode can be cleaned to prevent formation of harmful coating layer (col. 3 lines 8-10).

Therefore, it would have been obvious to one of ordinary skill in the art to have periodically cleaned the electrodes of the redox potential measurement device as taught

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by Rantapuska into the process of DE'020 in view of Gonzales Dominguez in order to prevent formation of harmful coating layer as taught by Rantapuska.

As admitted by the applicant on page 2, lines 7-12 of the instant specification, it is known to measure not only the redox potential but also the pH values inside a reactor and use the results of these measurements to adjust process variable such as zinc consumption.

Therefore, one of ordinary skill in the art would have found obvious to have incorporated pH measurement as admitted by the applicant into each of the metal removing steps of DE'020 in view of Gonzalez Dominguez and Rantapuska in order to optimize process variables such as zinc consumption.

Haanstra teaches that the acidity of a solution can be measured by using a titration method or a pH measurement and the titration method produces more accurate acidity measurements than pH measurement(col. 1 lines 34-40).

Therefore, it would have been obvious to one of ordinary skill in the art to have substituted the pH measurement in the process of DE'020 in view of Gonzalez Dominguez, Rantapuska, and admitted prior art with a titration method as suggested by Haanstra, which includes the claimed measurement of acidity by means of BT value, in order to achieve more accurate determination of solution acidity as taught by Haanstra.

Regarding claims 3-4, the process of DE'020 in view of Gonzalez Dominguez, Rantapuska, admitted prior art and Haanstra teaches the claimed adjustment of process variables based on the results from redox potential and acidity measurements.

Regarding claim 5, the three metal removing steps as taught by DE'020 reads on the claimed at least two reactors connected in series for metal removal as claimed.

Regarding claims 6-7, the process of DE'020 in view of Gonzalez Dominguez, Rantapuska, admitted prior art and Haanstra includes a redox potential measurement device positioned in the outlet pipe of a reactor, and an acidity measurement device inside a reactor as claimed.

Regarding claim 8, DE'020 teaches using a measurement electrode for measuring the redox potential as claimed.

Regarding claim 9, DE'020 teaches the claimed cobalt removal in the second step (page 2 of the machine translation, paragraph 3).

Regarding claim 10, it would have been obvious to one of ordinary skill in the art to have periodically cleaned the electrodes of the redox potential measurement device as taught by Rantapuska into the process of DE'020 in view of Gonzales Dominguez in order to prevent formation of harmful coating layer as taught by Rantapuska.

Regarding claim 11, since redox potential and acidity are measured in each of the three metal removal steps as taught by DE'020 in view of Gonzalez Dominguez, Rantapuska, admitted prior art and Haanstra, the examiner concludes that the process variables for each of the reactors in the process of DE'020 in view of Gonzalez Dominguez, Rantapuska, admitted prior art and Haanstra can be controlled separately.

Regarding claims 12-17, since the process of DE'020 in view of Gonzalez Dominguez, Rantapuska, admitted prior art and Haanstra comprises the same process steps as claimed and utilizes the same concept of optimization and manipulation of

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process variables such as zinc consumption using the measurement results from redox potential and acidity, the examiner concludes that the claimed zinc powder feeding device, redox potential and acidity measurement devices, adjustment device and control device are present the process of DE'020 in view of Gonzalez Dominguez, Rantapuska, admitted prior art and Haanstra in order to perform the intended process variable control and metal impurities removal.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LOIS ZHENG whose telephone number is (571)272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Roy King/
Supervisory Patent Examiner, Art
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